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Kwakiutl lived in a series of village communities in which descent was reckoned in the male line. Each clan "developed a clan tradition which was founded on the acquisition of a manitou by the mythical ancestor, the manitou becoming heredity in the clan." This manitou became attenuated to a crest which no longer descended in the male line, but may be given in marriage so that it descends upon the daughter's children. The nobility includes only the heads of families who personate the mythical ancestor.

Dr. Boas declares that the custom of the potlatch, which has been frequently described, has been thoroughly misunderstood by most observers. "The underlying principle is that of the interest-bearing investment of property." Strenuous efforts are made to acquire a fortune by imposing loans which bear a ruinous rate of interest upon friends and thrusting them upon rivals.

The authentic record of the traditions and the detailed account of the ceremonies of the secret societies, with the native nomenclature, furnish valuable material for comparative studies and lay bare to us the thoughts of this group of aborigines. It is usually much easier to collect the totem post which stands before the door than to correctly record the myth which accounts for the character of that house post. Frequently the ritual is accounted for by several myths, and is therefore presumed to be older than the myths. The secret societies, by whom the rites are performed, are believed to have originated from the habits of warfare.

The work is profusely illustrated and many songs and texts are given.

The Graphic Art of the Eskimos.¹ — In an abundantly illustrated paper, Dr. Hoffman has described the graphic art of the Western Eskimos, and has shown that the Eskimos east of Point Barrow "exhibit but little artistic expression, this being chiefly confined to lines, dots, and other similar rudimentary markings which are employed almost wholly for decorative purposes." The evidence that has been accumulated proves pretty conclusively that the modern Eskimos of Western Alaska, among whom artistic expression in graphic delineation has reached its highest development, have learned to carve and etch with steel tools under the instruction of the Russians. This disposes of the theory which derives the Eskimos from the cave dwellers of Europe.

¹ Hoffman, W. J. The Graphic Art of the Eskimos. *Ann. Rept. U. S. Nat. Mus.*, 1895, pp. 739-968.

The work follows along the lines of the author's previous publications relating to the pictographs of the American aborigines, and includes an account of these records and of the gesture signs in use among the Eskimos. The subject is treated comprehensively, with many comparisons to other culture groups.

F. R.

GENERAL BIOLOGY.

Chemical Changes in Plant Stimulation.¹—Hitherto we have had no test of the stimulation of a sensitive, responsive plant organ except the response itself. Czapek himself has been able to find in the terminal perceptive cells of the geotropically stimulated root no change in the protoplasm or cell sap, no visible movements in the mass, no secretory processes, no negative variation of the electric current such as the stimulated nerves of animals show, no change in osmotic cell pressure, no change in the normal, slightly acid, reaction.

The new find is a chemical change in the protoplasm. When the root-tip of a seedling of a bean or other species is boiled in an ammoniacal silver nitrate solution, there is a marked reduction of the silver, especially in the cells of the periblem. This reduction is stronger in the cells of stimulated than in those of unstimulated root-tips.

A second change consists in the diminution in the amount of a substance of the root-tip which easily loses oxygen. Such a substance is indicated in the normal root-tip by such changes as these: blue coloration (oxidation) of a section of the root-tip by an emulsion of guajac gum in water; deep blue coloration of sections by indigo white, made by careful reduction of indigo carmine by dilute hydrochloric acid and zinc; strong violet reaction (indophenol reaction) in sections subjected to an aqueous solution of *α*-naphthol, to which paraphenyldiamin has been added. Now, all such reactions are less marked in the root after stimulation. Thus, stimulation results in increased capacity for reduction and diminished capacity for oxidation — an increased avidity for oxygen.

These changes occur long before the response of turning shows itself, occur earlier the more sensitive the root, and are less marked after a slight stimulus such as results from a slight inclination of the root from verticality.

¹ Czapek, F. Ueber einen Befund an geotropisch gereizten Wurzeln. *Ber. deut. bot. Ges.*, Bd. xv, pp. 516-520. January, 1898.